APPENDIX C

Field Sampling for OU 10-04: Explosive Compounds

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C-1. INTRODUCTION

This Health and Safety Plan (HASP) appendix establishes the procedures and requirements that will be used to eliminate and/or minimize health and safety risks to persons working at the Operable Unit 10-04 RI/FS (OU10-04) ordnance sites. For more information on the requirements of the Occupational Safety and Health Administration (OSHA) standard, 29 Code of Federal Regulations (CFR) 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response (HAZWOPER)," see Section 1 of this HASP.

C-1.1 INEEL Site Description

For details on the location and operational history of the INEEL, see Section 1 and Figure 1 of this HASP.

C-1.2 Ordnance Sites Description

The OU 10-04 includes ordnance sites located at the INEEL (Figure C-1). Ten sites were identified in the OU10-03 Track 2 summary report (DOE-ID 1998) as requiring additional characterization. The 10 sites to be sampled include: (1) Naval Ordnance Disposal Area (NODA), (2) the Rail Car Explosion Area, (3) the Mass Detonation Area (MDA), (4) the National Oceanic and Atmospheric Administration (NOAA) Grid, (5) the Experimental Field Station, (6) the Fire Station II Area, (7) the craters east of the Idaho Nuclear Technology and Engineering Center (INTEC), (8) the Land Mine Fuse Burn Area, (9) Unexploded Ordnance (UXO) site east of Test Reactor Area (TRA), and (10) the Burn Ring south of Experimental Field Station.

C-1.2.1 Naval Ordnance Disposal Area

The NODA site is located approximately 1.6 km (1 mi.) northeast of U.S. Highway 20/26 between Mile Markers 266 and 267, and roughly 3.2 km (2 mi.) equidistant from the TRA, the INTEC, and the Central Facilities Area (CFA) at the INEEL. The NODA was used by the Navy as a disposal area for UXO and for treatment of nonradioactive hazardous material. The 1994 removal action defined the cleanup area as 0.16 km^2 (40 acres) in size and centered approximately 760 m (2,500 ft) north of the current INEEL security force gun range on Portland Avenue. The total area of the site is estimated to be 0.56 km^2 (138.38 acres). Removal actions for UXO were performed at this site in 1994, 1995, and 1997. UXO clearance is not complete at this site.

C-1.2.2 Railcar Explosion Area

This site, located near the west bank of the Big Lost River and along both sides of an undesignated dirt road, contains ordnance and pieces of explosives. The site is approximately 3.2 km (2 mi.) due west of Mile Marker 13 on Lincoln Boulevard, and the site is adjacent to the Big Lost River channel approximately 4.8 km (3 mi) northeast of the Naval Reactor Facility. It encompasses 1.95 km^2 (483 acres) and represents the debris scattered from a sympathetic detonation test involving five railroad

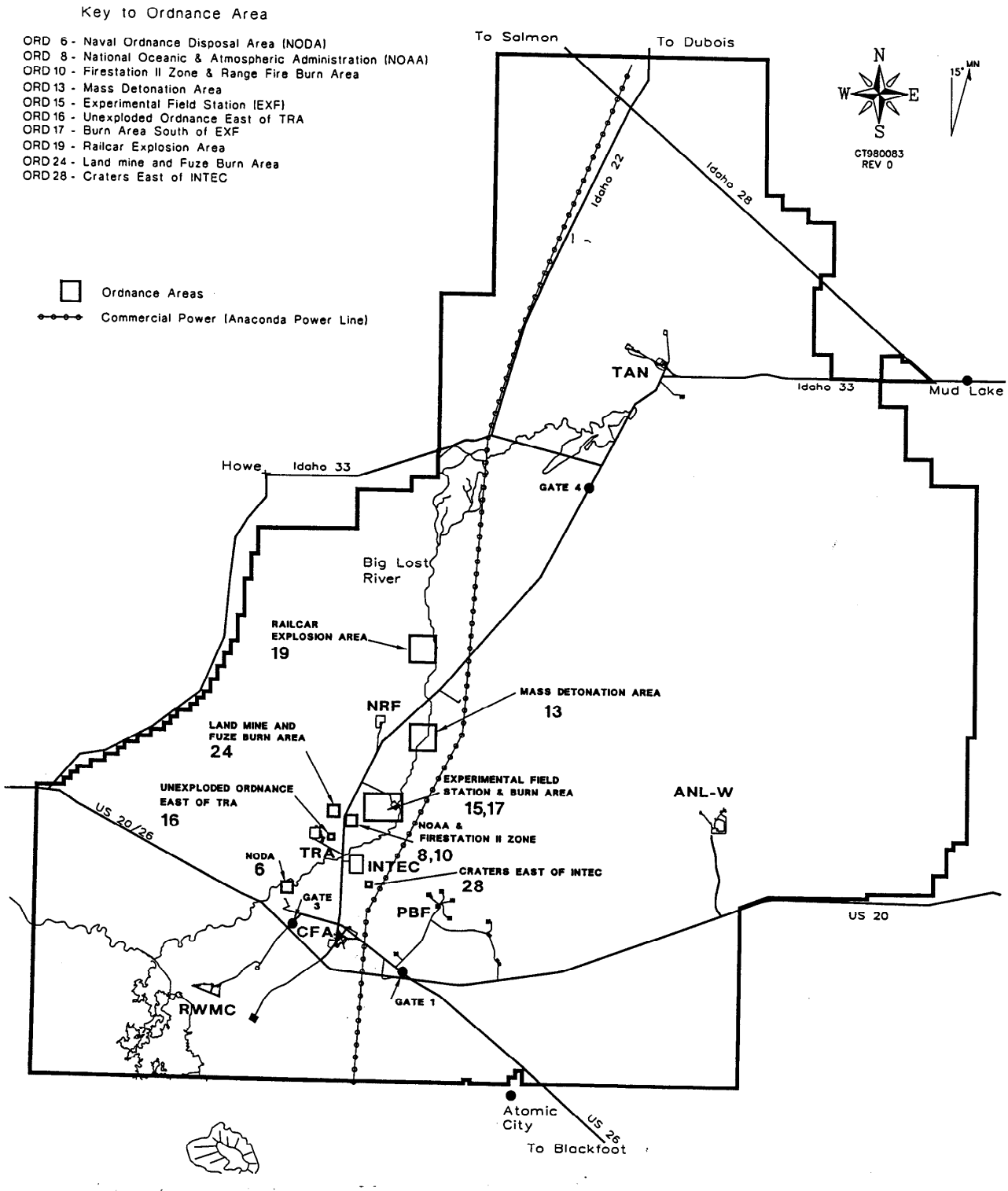

Figure C-1. Location of sites to be sampled for explosive compounds.

cars each loaded with 13,600 kg (30,000 lb) of explosive ordnance. Removal actions for UXO were performed at this site in 1996 and 1997. UXO clearance is not complete at this site. A total of 32 acres remain to be cleared of potential UXO.

C-1.2.3 Mass Detonation Area

The MDA is located 1.6 km (1 mi) east of Mile Marker 8 on Lincoln Boulevard. It is north of ICPP and approximately 3.2 km (2 mi) east of the Naval Reactor Facility. The site encompasses 3.22 km^2 (796 acres) and has been used for a number of small- to large-scale sympathetic and mass detonation tests with test shots ranging up to 227,000 kg (500,000 lb) of explosives. The site includes numerous blast craters varying in dimensions from a few feet to several tens of feet and is littered with large quantities of ordnance explosive (OE) waste, and structural debris scattered during past testing and recent ordnance detonation/disposal activities. The potential for UXO remaining at this site is high. Although UXO has been located and detonated at this site, a systematic and organized UXO clearance was not performed. Approximately 75 acres remain to the cleared of UXO.

C-1.2.4 National Oceanic and Atmospheric Administration Area Grid

The NOAA site is located just east of Lincoln Boulevard, approximately midway between Mile Markers 4 and 5. The site is thought to have been used for a variety of explosives tests and/or cleanup detonations following such tests. The area contains a number of small craters, low-ordered bomb casing and detonators, and widely-dispersed areas of OE. The NOAA grid has been, and is currently used by the NOAA and other governmental agencies for a variety of atmospheric/geodetic and weather-related monitoring and research work. Removal of UXO was performed during the 1993 OU 10-05 interim action and during the 1997 removal action. UXO clearance was completed at this site in 1997, however, small pieces of TNT remain at the surface.

C-1.2.5 Experimental Field Station

This site is located within the NPG gunnery range approximately 9.6 km (6 mi) downrange northeast of the CFA-633 NPG firing site and approximately 0.40 km (0.25 mi) west of the Big Lost River channel. The site encompasses 5.56 km^2 (1,375 acres) and includes multiple craters where a variety of explosive tests were conducted. The site is known to contain both UXO, OE, structural debris, and soil contamination. UXO clearance was completed at this site during the 1997 removal action, however an 0.8-acre area of TNT stained soil remains at this site.

C-1.2.6 Fire Station II

This area is located just east of Lincoln Boulevard at Mile Marker 5, and includes an area of approximately 3.24 km^2 (800 acres). In the early 1970s, the 3.24-km^2 (800-acre) area was included in a range fire that reportedly burned some UXO. Earlier NPG activities at the site included some low-order bomb detonations that scattered UXO and OE waste (including pieces of high explosives) over several areas of the site. Removal of UXO was performed during in 1993 and 1997. Unexploded ordnance (UXO) clearance was completed at this site in 1997. A total of 55 lb of TNT were removed from this site indicating that the potential for soil contamination is high.

C-1.2.7 Craters East of INTEC

This site encompasses 0.69 km^2 (171 acres) and includes three craters located approximately 0.8 km (0.5 mi) southeast of INTEC. The area adjacent to and surrounding the craters is littered with some widely scattered UXO debris and OE waste resulting from explosives tests or cleanup detonations

associated with such tests. Unexploded ordnance (UXO) was removed from this site during the 1997 removal action and UXO clearance is complete. A total of 39 lb of TNT were removed from this site indicating that the potential for soil contamination is high.

C-1.2.8 Land Mine Fuse Burn Area

This site is 0.8 km (0.5 mi) west of Lincoln Boulevard and approximately 0.8 km (0.5 mi) north of the Fire Station II training area (Mile Marker 5). It consists of approximately five separate ordnance disposal locations in a 81,000-m^2 (20-acre) area between a meander of a former channel of the Big Lost River and an old abandoned irrigation canal that was hand dug in the early 1900s. The site was used by NPG personnel for burial of land mine pressure plates, aerial bomb packaging materials, and as an area to dispose of land mine fuses by burning. Unexploded ordnance (UXO) was removed from this site during the 1996 and 1997 removal actions. Unexploded ordnance (UXO) clearance is not complete at this site. One acre requires remediation of live fuses at the surface and subsurface.

C-1.2.9 Unexploded Ordnance Site East of TRA

The approximate location of this site is T3N, R30E, Section 13 [approximately 20,234 m^2 (5 acres)]. Approximately 18 low-ordered U.S. general purpose bombs that contained partially burned explosive filler were found at the site and transported to the Mass Detonation Area (MDA) for disposal by detonation during the 1996 removal action. The area was also surface cleared of pieces of trinitrotoluene (TNT), explosive boosters, and ordnance scrap, which was also transported to the MDA for disposal by detonation. UXO clearance was completed in 1996. Since TNT was removed from the sites, the potential is high that TNT soil contamination may exist.

C-1.2.10 Burn Ring South of Experimental Field Station

The approximate location of the site is T3N, R30E, Section 17. The site consists of the area contained within a round, metal containment barrier or ring approximately 15 cm (6 in.) in height and approximately 3 to 5 m (10 to 15 ft) in diameter. The site resembles a campfire ring or pit. The ring is located approximately 10 km (6 mi) northeast of the CFA-633 NPG firing site and is adjacent to the most southern concrete revetment walls located between the Experimental Field Station and the Big Lost River channel. This site was not documented in the records search, but is suspected of having been used as smoke generator or an illumination marker for nighttime gunnery activities associated with the concrete revetment walls. Wire coils and burn residues similar to those left following the burning of old tires were found within the metal ring and require characterization.

C-1.3 Source, Nature, and Extent of Contamination

The following sections provide a summary of the available analytical data for the 10 sites. No sampling data are available for the Railcar Explosion Area, the MDA, the Craters East of INTEC, the Burn Ring, and the Land Mine Fuse Burn Area.

C-1.3.1 Naval Ordnance Disposal Area

Sampling data at NODA indicate that soils contain detectable levels of hazardous materials from treatment and disposal processes (Table C-1). These samples indicate that there are no PCBs and low concentrations of VOCs such as acetone and methylene chloride. Several semivolatile organic compounds (SVOCs) are above the MDL and many metals above the 95% upper tolerance limit as determined from INEEL background data. There were no radionuclides above background levels. Twenty-five samples were reanalyzed for picric acid, three additional metals,

Table C-1. August 1995 NODA validated sample results.

Analyte	Average (mg/kg)	Standard Deviation (mg/kg)	Number of Detects	Maximum (mg/kg)	Minimum (mg/kg)	Risk-Based Concentration (mg/kg)
Picric Acid	0.37	0.41	6	1.16	0.108	N/A
RDX	73.1	93.7	10	328	2.26	18
Tetryl	3.55	5.84	5	13.9	0.427	N/A
TNT	2.86	4.35	5	10.6	0.286	47
Phosphorous	18.6	17.6	11	63.2	3.04	N/A
Nitrate	7.5	4.3	11	18.2	4.2	N/A

nitroaromatics, and inorganics (i.e., total phosphorous and nitrate/nitrite). Five of the samples had concentrations of RDX higher than the MDL, and one of the samples had concentrations of HMX, 1,3,5-trinitrobenzene (TNB), 1,3-dinitrobenzene, TNT, 4-amino-2,6-dinitrotoluene (DNT), and 2-amino-4,6-DNT above the MDL. All 25 sample results had concentrations of lithium and strontium metals (nonradioactive) above the MDL. Picric acid was not found in any of the 25 samples. Other than for TNT analysis, these samples exceeded the recommended holding times for the other analytes.

Ten locations were sampled in August 1995 for picric acid, nitroaromatics, and inorganic (phosphorous and nitrate) analyses. Picric acid was detected in six of the 10 samples, ranging from 0.108 to 1.16 mg/kg. Detected nitroaromatics include RDX, tetryl, and TNT.

C-1.3.2 Rail Car Explosion Area

No sampling data exist for this site.

C-1.3.3 Mass Detonation Area

During the 1997 noncritical removal, approximately 60 samples were collected and analyzed for explosives. With the exception of two samples, which indicated low concentrations of 2,4-dinitrotoluene, results were U-flagged to indicate explosive compounds were nondetectable or were below the analytical detection limit.

C-1.3.4 National Oceanic and Atmospheric Administration Grid

In 1993, 382 soil samples were collected and analyzed for TNT and RDX. The results for TNT ranged from 0.0 to 17,014 mg/kg, and the results for RDX ranged from 0.0 to 53 mg/kg. Following excavation of contaminated areas during the 1993 interim action, 17 verification samples were collected for TNT analysis and nine verification samples for RDX analysis. Only one sample showed the presence of TNT at a concentration of 6.7 mg/kg. None of the RDX samples showed the presence of the analyte. These results were obtained by an off-Site laboratory analysis.

C-1.3.5 Experimental Field Station

Nineteen samples were collected from this site during the 1996 Track 2 field investigation. The results ranged from less than 1 to 25,250 mg/kg for TNT. As with the 1993 interim action conducted at NOAA, these results were obtained using a TNT soil test system. In addition to the 19 samples collected

for field screening, two samples were collected and submitted to the laboratory for analysis. Both samples contained 1,3,5-TNB, amino-DNTs, TNT, and 2,4-DNT (Table C-2).

C-1.3.6 Fire Station II

During the 1993 interim action, a total of 20 samples were collected and analyzed for TNT and RDX using the EnSys TNT/RDX soil test system in the field. The results ranged from 0.0 to 2,141 mg/kg for TNT and 0.0 to 4.7 mg/kg for RDX. Following excavation of contaminated areas during the 1993 interim action, four verification samples were collected and analyzed for TNT and RDX (Table C-3).

C-1.3.7 Craters East of INTEC

No sampling data exist for this site.

C-1.3.8 Landmine Fuse Burn Area

No sampling data exist for this site.

C-1.3.9 Unexploded Ordnance Site East of TRA

No sampling of this site was performed during the 1996 field assessment because the site was remediated during the 1996 removal action. The site was cleared of UXO and pieces of explosives during the 1996 removal action. However, approximately 12 areas have visibly stained soil. The TNT stains are approximately 0.2 m^2 (2 ft^2) in area and 5 cm (2 in.) in depth and require characterization.

C-1.3.10 Burn Ring South of Experimental Field Station

No sampling data exist for this site.

Table C-2. Experimental field station validated sample results.

	Sample Number		
Analyte	EXA00101N7	EXA00201N7	Risk-Based Concentration
1,3,5-TNB	78 mg/kg	33 mg/kg	N/A
Amino-DNTs	8 mg/kg	6.1 mg/kg	N/A
TNT	76 mg/kg	5.8 mg/kg	47 mg/kg
2,4-DNT	0.25 mg/kg	0.32 mg/kg	35 mg/kg

Table C-3. 1993 unvalidated sample results for the Fire Station II area.

Analyte	Average mg/kg	Number of Detects	Maximum mg/kg	Minimum mg/kg	Risk-Based Concentration mg/kg
RDX	0.53	2	1.1	1	18
TNT	9.8	3	29	3.6	47

C-1.4 Scope of Work

The scope of work for the collection of explosives compounds in soil includes:

- Collection of surface soils between 0 to 0.15 m (0 to 0.5 ft) using a decontaminated trowel, spoon, or shovel and placed directly into appropriate sample containers.
- Collection of subsurface samples [>0.15 m (0.5 ft)] using a hand auger. At the discretion of the HSO, a magnetometer survey may be required before sample collection via hand auger.
- Collection of duplicates, rinsates, or filed blanks as specified in the FSP.
- Decontamination of sampling equipment per LMITCO ER SOP 11.5, "Field Decontamination of Sampling Equipment," with the exception that isopropanol will not be used.
- Use of Global Positioning System (GPS) to locate or mark sampling locations.
- Labeling, packaging, and shipment of samples to an off-Site analytical facility.

C-2. KEY SITE PERSONNEL RESPONSIBILITIES

The organizational structure for this project reflects the resources and expertise required to perform the work, while minimizing risks to worker health and safety, the environment, and the general public. The names of the individuals in key roles at the site, and lines of responsibility and communication, are shown on the organizational chart for the site (Figure C-2). Descriptions and responsibilities of key site personnel are detailed in Section 2 of this HASP.

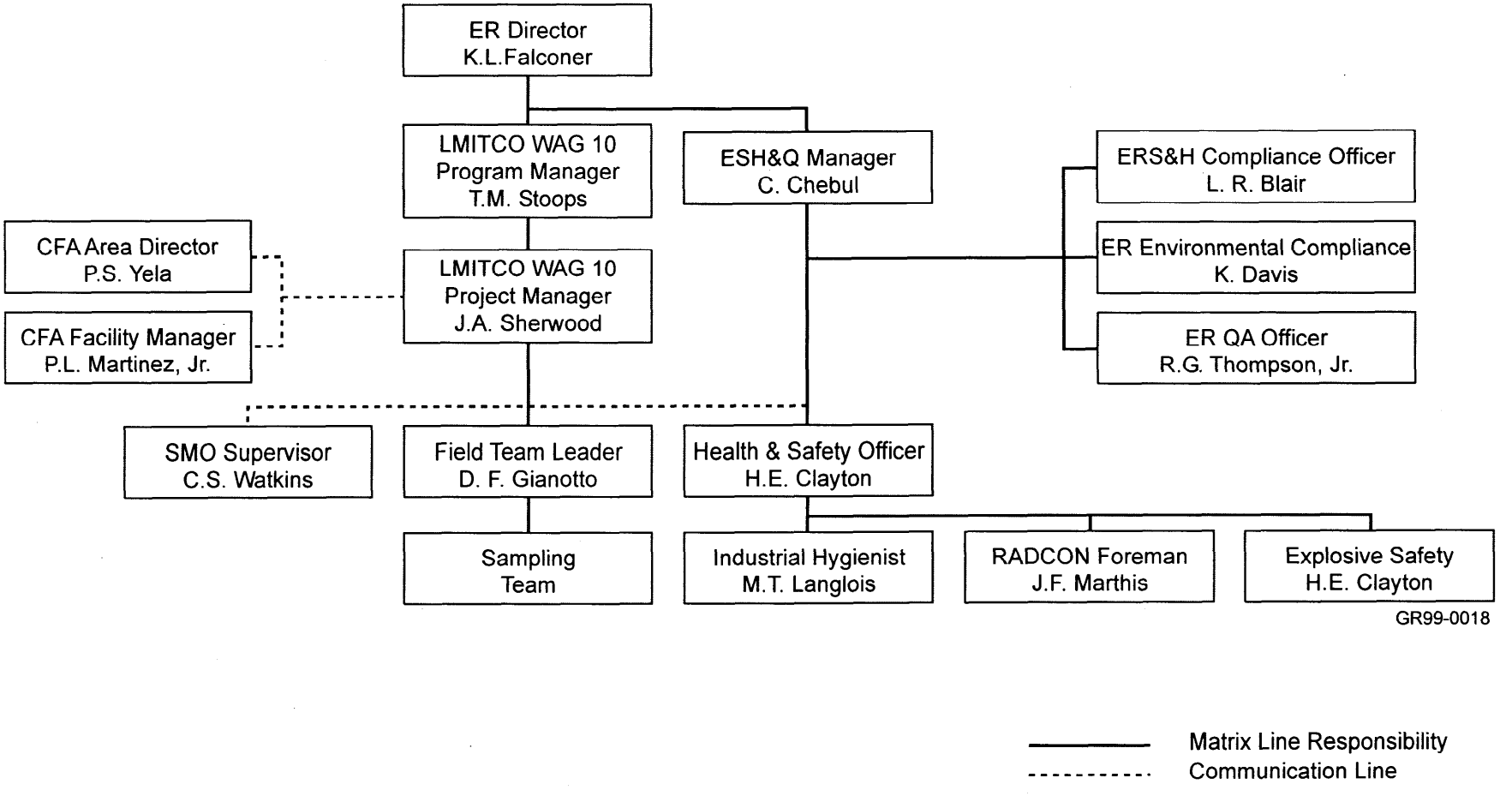

Figure C-2. Organizational chart for OU10-04 explosive compounds sampling project.

C-3. RECORDKEEPING REQUIREMENTS

There are no site-specific changes for recordkeeping requirements. See Section 3 of this HASP for information and requirements regarding recordkeeping requirements.

C-4. PERSONNEL TRAINING

All site personnel shall receive training as specified in OSHA 29 CFR 1910.120/1926.65 and the LMITCO *Safety and Health Manuals*. Specific training requirements for each worker may vary depending on the hazards associated with their individual job assignment and required access into radiologically controlled areas.

Proof that all required training courses have been completed (including applicable refresher training) must be maintained on the site at all times. Examples of acceptable written training documents include: LMITCO, "40 Hour OSHA HAZWOPER Card," LMITCO, "Respirator Authorization Card," "DOE Certificate of Core Radiological Training II Card," "Medic/First Aid Training Card," and/or a copy of an individual's or department's TRAIN System printout demonstrating completion of training. A copy of the certificate issued by the institution where the training was received is also acceptable proof of training.

Before beginning work at the site, site-specific training will be conducted by the FTL or HSO. This training will consist of a complete review of this HASP and attachments, with time for discussion and questions. At the time of this training, personnel training records will be checked and verified to be current and complete for all required training (Table C-4). Upon completing site-specific training, personnel will sign the training acknowledgement form indicating that they have received this training, understand the tasks and associated hazards that will be conducted, and agree to follow all HASP and other safety requirements.

For this project, each 40-hour trained worker's performance will be monitored by the FTL or HSO for 3 days of site activities. This will satisfy the HAZWOPER initial 24-hour supervised field experience. After observing satisfactory work performance, the supervisor will complete the observation checklist and the worker signs the Field Experience Acknowledgment Form indicating that they have demonstrated acceptable performance during the 3 days of actual HAZWOPER activities. A copy of this form will be provided to the worker. LMITCO training records shall be forwarded to the LMITCO Environmental Operations (EO) training coordinator (MS 3902) for retention in the employee training records (TRAIN).

A daily prejob safety briefing of the task(s) to be performed that day will be conducted by the FTL, HSO, or IH, as applicable. During this briefing, tasks are to be outlined, hazards identified, hazard controls and work zones established, PPE requirements discussed, and employees questions answered. At the completion of this briefing any required work control documents will be read and signed. Particular emphasis will be placed on lessons learned from the previous day's activities and how tasks can be completed in the safest, most efficient manner. All personnel will be asked to contribute ideas to enhance worker safety and mitigate potential exposures at the site.

Table C-4. Required training for Site personnel.

Task/Position (Topic)	FTL and HSO (Required)	Field Team (Required)	Nonworkers [g] (Required)	Visitors [h] (Required)
Site-specific training[a]	X	X	X	X
Decontamination[b]	X	X	X	X
Hazard communication[b]	X	X	X	X
Fire Extinguisher Training[b]	X	X		
Site control and warning devices[b]	X	X	X	X
HASP Emergency Response Plan (Section 11)[b]	X	X	X	X
40-hour HAZWOPER [c]	X	X		
8-hour HAZWOPER site supervisor	X			
Hearing conservation				
CPR and Medic First Aid[d]	X	X[e]		
Respirator qualification and fit test				
Ordnance awareness training	X	X	X	X
HAZMAT employee general awareness training[f]	X[i]			

a. Training will be documented using HASP acknowledgement forms (site-specific training and 24-hr supervised experience).

b. Will be included in site-specific training.

c. Includes 40 hours of classroom instruction and 24 hours of supervised field experience.[a]

d. Two Medic First/CPR qualified individuals must be present during site activities.

e. At least one other member (other than the FTL) must be trained.

f. If identified as "HAZMAT" employee [i.e., anyone who directly affects hazardous material transportation safety by handling, packaging, labeling, loading, unloading, moving, driving, etc. (per 49 CFR 171.8)].

g. Nonworkers (occasional site workers) who must enter the EZ are required to have the training necessary to perform their assigned tasks within the EZ. This may include the same training as FTL (depending on the task location).

h. Visitors are required to meet the non-worker training requirements, at a minimum, if they enter the EZ.

i. Shipping personnel only in relationship to their duties. Project personnel receive awareness training as part of their routine jobs in relationship to the project (see Section 11).

C-5. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

There are no site-specific changes to the occupational medical surveillance program. For information regarding Occupational Medical Surveillance Programs requirements, see Section 5 of this HASP.

C-6. ACCIDENT PREVENTION PROGRAM

There are no site-specific changes to the Accident Prevention Program. For information regarding the Accident Prevention Programs, refer to Section 6 of this HASP.

C-7. SITE CONTROL AND SECURITY

For definitions and descriptions of the various zones and areas used to control site access, tasks, and uses (i.e., Exclusion Zone, Contamination Reduction Zone and Corridor, Support Zone, etc.), refer to Section 7 of this HASP. Because of the unique nature of these field activities (i.e., remote locations, large site areas, significant distances between sampling locations within a site), the control zones are designed to be mobile, easily transported, and quickly established. The model for establishing work zones at the ordnance areas is presented in Figure C-3.

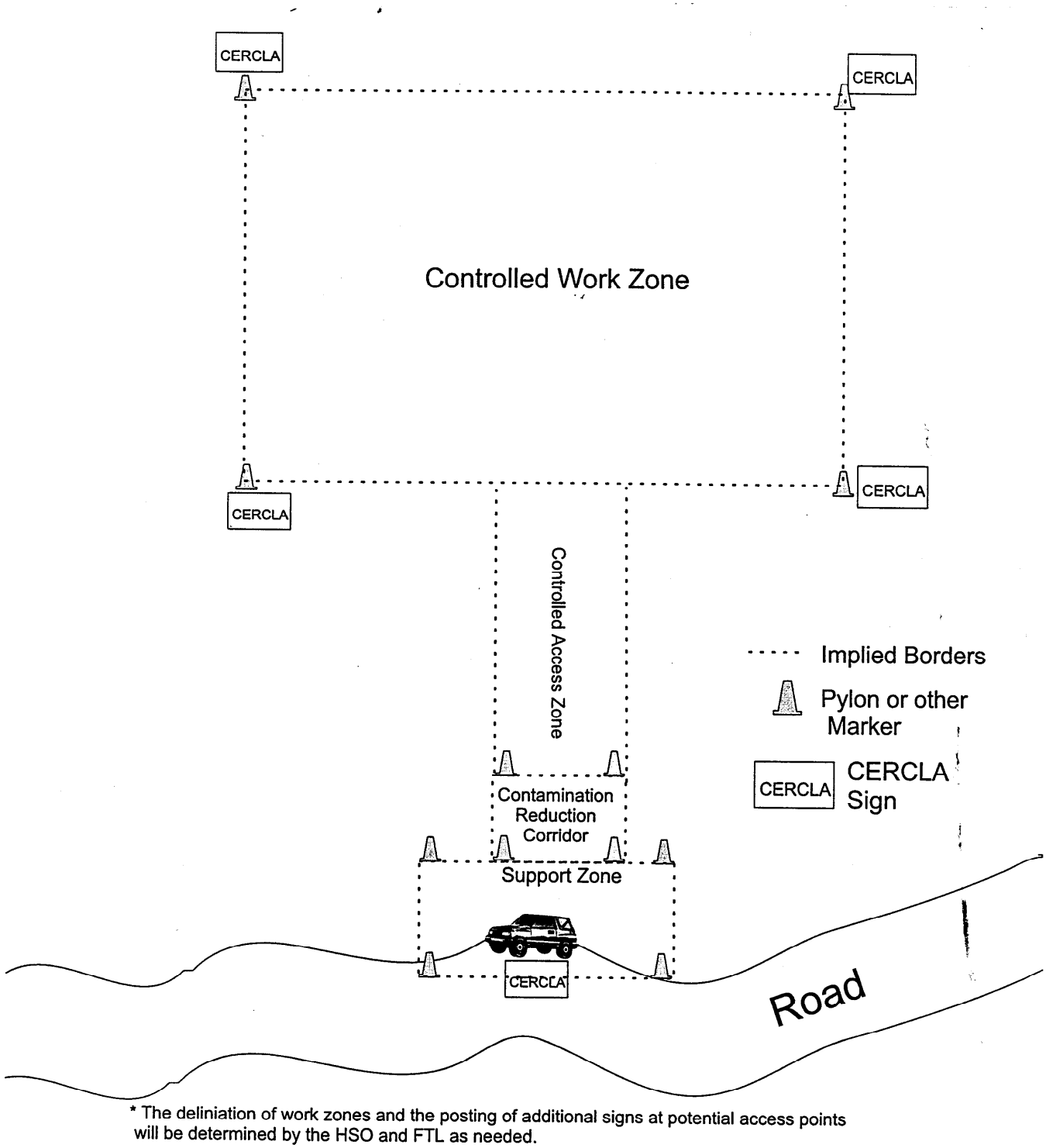

Figure C-3. Work area for ordnance sites.

C-8. HAZARD ASSESSMENT

Section 8 of this HASP provides general information regarding the types of hazards that may be encountered while performing field work. Specific hazards associated with OU10-04 RI/FS explosive compounds in soil sampling activities are presented in this section.

Table C-5 summarizes the anticipated activities and tasks to be performed and the types of hazards that may be associated with the tasks.

Table C-6 provides an evaluation of the contaminants that may be encountered during field activities and details on exposure limits, routes of exposure, symptoms of overexposure, and the potential for exposure.

Tables C-7 and C-8 outline specific monitoring requirements and monitoring equipment that may be used for specified tasks or activities.

Table C-9 indicates action levels for specified contaminants and the response required if the action level is exceeded.

Table C-5. OU10-04 explosive compounds in soil activities and associated hazards.

Activity or Task	Associated Hazards or Hazardous Agent
Premobilization	Equipment movement/vehicle traffic Lifting/backstrain
Performance of Work – daily preparation – sampling – decontamination – documentation – packaging and shipping – daily closeout	Chemical/inorganic contaminants Equipment movement/vehicle traffic Lifting/backstrain Heat or Cold exposure Biological (snakes bits, Haunta virus) Slip/trip/fall
Demobilization and Closeout of Project	Chemical/inorganic contaminants Equipment movement Lifting/back strain

Table C-6. Evaluation of contaminants at the OU10-04 RI/FS Explosives Compounds in Soil site.

Material or Chemical (CAS #, Vapor Density & Ionization Energy	Exposure Limit[a] (PEL/TLV)	Routes of Exposure[b]	Symptoms of Overexposure[c] (Acute and Chronic)	Target Organs/System	Carcinogen? (source)[d]	Exposure Potential[e] (all routes without regard to PPE)
Organic Compounds						
PCB's 11097-69-1	TLV - 0.5 mg/m3	Inh, Ing, Abs	CNS depression, dermatitis	Skin, Liver, CNS	IARC Yes	Low
Total Petroleum Hydrocarbons 8006-61-9	TLV - 300 PPM	Inh, ing, abs	Skin, eye, respiratory irritation, liver and kidney damage	Skin, Resp, Liver, CNS	NO	Low
TNT 118-96-7	TLV— 0.5 mg/m3 PEL— 1.5 mg/m3	Inh, abs, ing	Liver damage, cyanosis, kidney damage, dermatitis, cardiac irregularities	Liver, cardiac, kidneys, skin, CNS	A1- ACGIH	Low
RDX 121-82-4	TLV - 1.5 mg/m3 PEL - 1.5 mg/m3	Inh, abs, ing	Muscle twitch, convulsions, cramps,	Skin, resp, CNS	A2- ACGIH Yes - OSHA	Low
DNT 25321-14-6	TLV - 0.15 mg/m3 PEL - 1.5 mg/m3	Inh, abs, ing	Cyanosis, anemia, jaundice	Blood, liver, CVS		Low
TNB 99-35-4	None Listed	Inh, abs, ing	UR irritant	Resp	No	Low
HMX	PEL - 1.5 mg/m3	Inh, ing, abs	Convulsions, muscle twitching,	Skin, CNS, Resp	No	Low
DNB 528-29-0	PEL - 1.0 mg/m3	Ing, inh, abs	Cyanosis, anemia, irritation, liver damage	Blood, CNS, liver	No	Low
Metals and Inorganic Compounds						
Arsenic 7440-38-2	TLV- 0.01 mg/m3	Inh, ing	Skin and eye irr, CNS	CNS, Skin, liver	Yes - OSHA ACGIH A-1	Low
Barium 7440-39-3	TLV - 0.5 mg/m3	Inh, ing	Irritation, GI, Burns, Muscle toxin	Muscle, GI	No	Low

Table C-6. (continued).

Material or Chemical (CAS #, Vapor Density & Ionization Energy	Exposure Limit[a] (PEL/TLV)	Routes of Exposure[b]	Symptoms of Overexposure[c] (Acute and Chronic)	Target Organs/System	Carcinogen? (source)[d]	Exposure Potential[e] (all routes without regard to PPE)
Cadmium 7440-43-9	TLV - 0.002 mg/m3	Inh, ing	Kidney failure, respiratory system collapse, cancer	Kidney, lung	ACGIH A-2 OSHA	Low
Chromium (total +3) 7440-47-3	TLV 0.5 mg/m3	Inh, ing	Irritation, dermatitis	Skin	NO	Low
Lead 7439-92-1	TLV 0.05 mg/m3 PEL 0.05 mg/m3	Inh, Ing	Infertility, tremors,	CNS, GI, Blood, Kidney, Reproductive	No	Low
Mercury 7439-97-6	TLV 0.025 mg/m3	Inh, Ing	Neuropathy, visual impairment, kidney failure	CNS, kidney	No	Low
Selenium 7782-49-2	TLV 0.2 mg/m3	Inh, Ing	Skin and respiratory Irritation	Skin, Resp	No	Low
Silver 7440-22-4	TLV 0.1 mg/m3	Inh, Ing	Argyria, Irritation	Skin, eye, Resp	No	Low

a. ACGIH 1997 TLV Booklet and OSHA 29 CFR 1910 substance specific standards.

b. (Ih) inhalation; (Ig) ingestion; (S) skin absorption; (Con) contact hazard.

c. (nervous system) dizziness/nausea/lightheadedness; (dermis) rashes/itching/redness; (respiratory) respiratory effects; (eyes) tearing/irritation.

d. If yes, identify agency and appropriate designation (ACGIH A1 or A2; NIOSH; OSHA; IARC; NTP).

e. Estimates (≈) of specific compounds.

VD = vapor density (Air = 1)	CNS = central nervous system	CVS = cardiovascular system	RESP = respiratory system
GI = gastrointestinal	PEL = permissible exposure limit	TLV = threshold limit value	REM = roentgen equivalent man
RCM = radiological control manual	DAC = derived air concentration	IE = ionization energy	eV = electron volts

Table C-7. Project hazards that may be monitored.[a]

Task or Activity	Hazards to be Monitored
Phase I: Mobilization	None
Phase II: Performance of Work	Total Petroleum Hydrocarbons (as deemed necessary by IH) Metals (as deemed necessary by IH) Heat and/or Cold stress (as deemed necessary by IH)
Phase III: Demobilization and Closeout	None

a. Monitoring will be conducted as deemed appropriate by project IH based on specific tasks and site conditions.

Table C-8. Equipment to be used for monitoring hazards.

Chemical or Radiological Hazard to be Monitored or Sampled	Equipment and Monitoring/Sampling Method	
Total Petroleum Hydrocarbons	PID	
Metals	Personal sampling pumps and appropriate media	NIOSH 7300
Heat/cold stress	Heat Stress—WBGT, body wt, fluid intake	Cold Stress—ambient air temp, wind chill charts

Table C-9. Action levels and associated responses for project hazards.

Contaminant/Agent Monitored	Action Level (AL)	Response Taken if AL Exceeded
Total Petroleum Hydrocarbons	150 ppm	Stop work activity, Upgrade PPE to Level C

C-9. PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) requirements for soil sampling of explosive compounds are outlined in Table C-10. For general descriptions of the types of PPE and the levels of PPE, refer to Section 9 of this HASP.

Table C-10. PPE requirements and modifications for sampling of explosive compounds.

Task or Assignment	Level of PPE	Modifications and Comments
	PHASE I ACTIVITIES	
Preparation of sampling equipment, mobilization and deployment	Modified Level D	Work clothes or coveralls. Work gloves, eye protection, and head protection, as warranted.
	PHASE II ACTIVITIES	
1. Sample Collection	Modified Level D	Work clothes or coveralls. Work gloves and Nitrile liners, eye protection, and head protection as warranted..
2. Equipment Decontamination	Modified Level D	Work clothes or coveralls. Work gloves and Nitrile liners, eye protection, and head protection as warranted.
3. Sample preparation and shipment	Modified Level D	Work clothes or coveralls. Work gloves, eye protection, and head protection as warranted.
	PHASE III ACTIVITIES	
Demobilization and Closeout	Modified Level D	Work clothes or coveralls. Work gloves, eye protection, and head protection as warranted.

C-10. DECONTAMINATION PROCEDURES

For general information describing the control and prevention of contamination and emergency decontamination procedures, refer to Section 10 of this HASP. For specific procedures for the decontamination of sampling equipment, refer the OU 10-04 Work Plan/FSP for explosive compounds.

During field activities, a wash station will be available to field personnel for washing their hands and face. All personnel will use the wash station following sampling activities. An eyewash station will also be available onsite.

C-11. EMERGENCY RESPONSE PLAN

General information regarding Emergency Response Plans, (including types of emergency events, emergency facilities, emergency communications, emergency response roles and responsibilities, recognition of emergency warnings, and reentry/recovery after an emergency event) are covered in Section 11 of this HASP. Site-specific information such as emergency equipment (Table C-11), emergency contact lists (Table C-12), and location of CFA Medical Facilities are covered in this section.

Per MCP-2725 (*Field Work at the INEEL)*, the CFA Emergency Response Organization will ensure personnel performing field work are notified of emergency conditions and the appropriate actions to take via radio and/or pager communications. As such, it is required that the FTL or HSO is available and able to communicate with field workers at all times. At each site to be sampled, the routes to the CFA medical facilities will be reviewed. Medial Facilities for CFA are shown in Figure C-4.

Table C-11. Emergency response equipment to be maintained at the site.

Equipment Name and Quantity Required	Location at Task Site	Responsible Person	Frequency of Inspection
Fire extinguishers One ABC per vehicle	Vehicle	FTL, HSO, or IH	Weekly
First aid supplies One per vehicle	Vehicle	FTL, HSO, or IH	Weekly
Eyewash station One for Sampling Team	Vehicle	FTL, HSO, or IH	Weekly
Communication equipment 1-Pager, 1-Radio, and 1-Cell phone per FTL	On person	FTL, HSO, or IH	Daily
Shovel One per vehicle	Vehicle	FTL, HSO, or IH	Daily

Table C-12. Project emergency contact list to be posted at Job Site.

Contact Title	Contact Name	Phone #/ Radio Net	Pager Number
Warning Communications Center (WCC)		777, 6-1515, KID-240	
CFA Facility Manager	Paul Martinez	6-2150	6646
CFA Area Director	Paul Yela	6-8899	6264
CFA ESH&QA Supervisor	Robert McFarlane	6-8205	5712
First Aid (CFA Medical Dispensary, CFA-1612) See Figure C-4.		777, 6-2356	
Occupational Medical Program		6-1596	
Fire/Security		777	
LMITCO ER Project Manager	Julie Sherwood	6-9369	6420
LMITCO ER Project Health & Safety Officer	Hance Clayton	521-8404	7557
LMITCO CFA Radiological Control	John Marthis	6-2558	6072
LMITCO ER Industrial Hygiene	Mark Langlois	6-0127	9042
LMITCO Field Team Leader (FTL)	David Gianotto	6-8529	5484
LMITCO ER S&H Compliance Officer	Lawrence Blair	6-4113	5869
LMITCO ER Environmental Compliance Officer	Katherine Davis	6-4949	7833
LMITCO ER ES&H/QA Manager	Charles Chebul	6-9566	5689
CFA DOE-ID Facility Representative	Roderick Taft	6-8838	6250

In the event of an emergency, be prepared to provide the following information to the Emergency Response Organization (ERO):

- Your name, telephone number, pager number
- Exact location of the emergency
- Nature of the emergency, including time of occurrence, current site conditions, and special hazards in the area
- Injuries, if any, including numbers of injured, types of injuries, conditions of injured
- Additional information as requested.

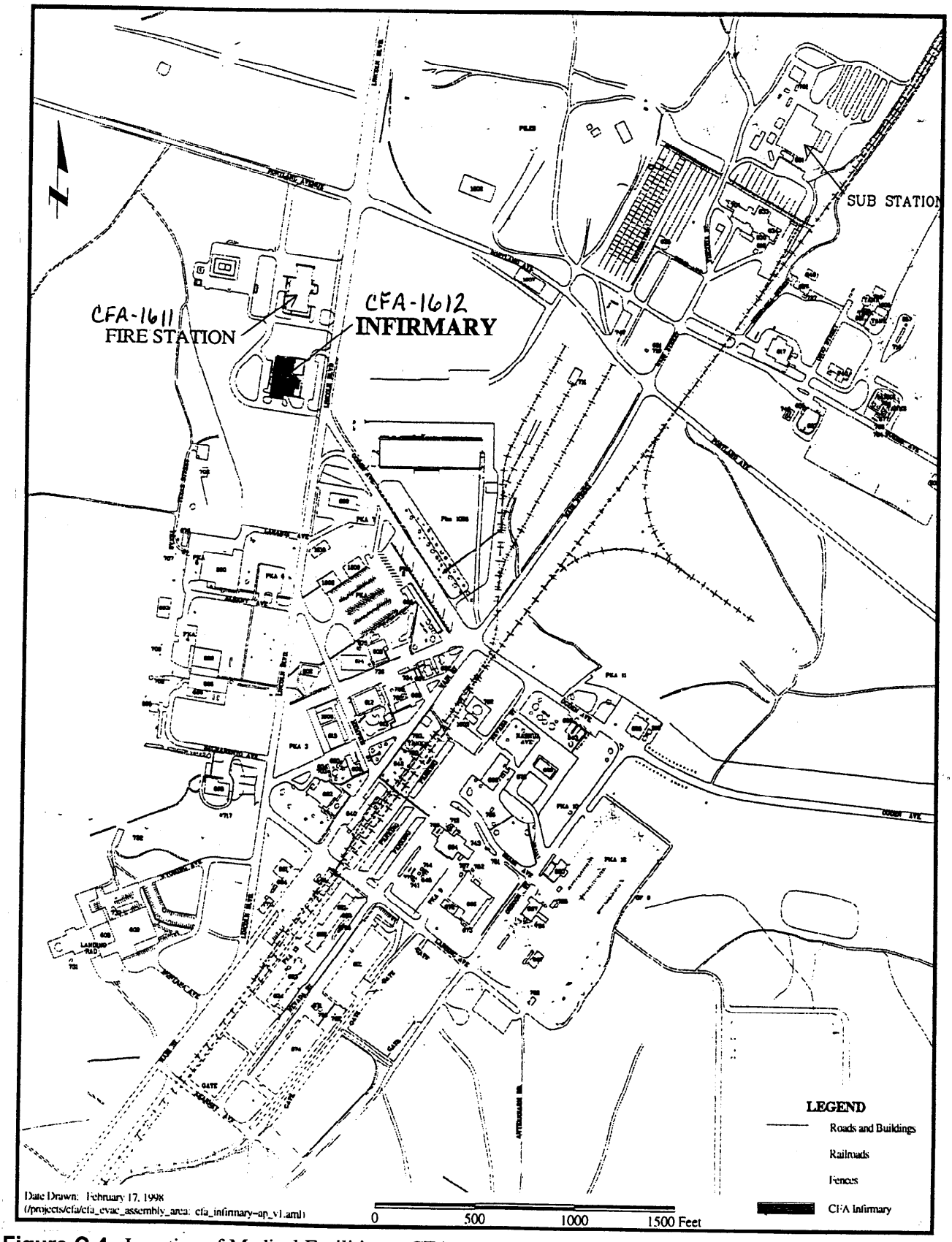

Figure C-4. Location of Medical Facilities at CFA.

C-12. NOTIFICATION RESPONSIBILITIES

This reference list (Table C-13) will be posted at each support zone and to the offices of those assigned notification responsibilities.

Table C-13. Notification responsibilities.

Responsible Person or Organization		Phone	Pager	Radio
FTL or HSO notifies	INEEL Emergency Response Telephone Number	777	—	KOK 130
FTL or HSO notifies	Warning Communications Center (WCC)	777 or 526-1515	—	KID 240
FTL or HSO notifies	INEEL Spill Notification Team (SNT), for spills	—	6400	—
FTL or HSO notifies	INEEL Occupational Medical Program, for occupational illness or injury	526-1596	—	—
FTL or HSO notifies	CFA Facility Manager	526-2150	6646	—
FTL or HSO notifies	CFA Area Director	526-8899	6264	—
FTL or HSO notifies	CFA ESH&QA Supervisor	526-8205	5712	—
FTL or HSO notifies	LMITCO Project Manager	526-9369	6420	
FTL, HSO, or PM notifies	LMITCO ER S&H Compliance Officer	526-4113	5869	
FTL, HSO, or PM notifies	LMITCO ER Environmental Compliance Officer	526-4949	7833	
FTL, HSO, or PM notifies	CFA DOE Facility Representative	526-8838	6250	—
FTL, HSO, or PM notifies	LMITCO ER ES&H/QA Manager	526-9566	5689	—